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Melolonthine beetles (Scarabaeidae, Melolonthinae) obtained by UV Light Trap in and around Lambir Hills National Park, Sarawak, Borneo Island

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ABSTRACT The results of an examination of melolonthine beetles collected in and around Lambir Hills National Park, Sarawak, Malaysia in Borneo are presented. Twenty one species in total are listed.

KEY WORDS Coleoptera / Scarabaeidae / Melolonthinae / inventory / tropical rainforest

Introduction

Since its Canopy Biology Program started in 1992, Kyoto University has conducted studies into the biological dynamics and diversity of low elevation tropical forests in Lambir Hills National Park, Borneo Island, East Malaysia. Lambir Hills National Park, where the base camp for this program is situated, is located at 4˚2'N, 113˚50'E, at an elevation of 150-200m. A faunal investigation into butterflies was conducted as part of the program, and also as part of the Land Use and Biodiversity at Lambir (LUBL) Project which followed it. The results were documented by Itioka et al. (2009), and confirmed the presence of 341 species of butterflies. Through these programs and projects, faunal investigations were also conducted using ultraviolet light (UV) traps at night. Based on the enormous amount of material collected by these traps, Kishimoto-Yamada et al. (2008, 2009) investigated how the number of emerging leaf beetles (Chrysomelidae) changed between the flowering and non-flowering seasons of canopy-forming trees in these primary forests. The authors also examined seasonality in abundance fluctuations of multiple light-attracted beetles (Chrysomelidae: Kishimoto-Yamada et al. 2010; Scarabaeidae: Kishimoto-Yamada et al. 2013) .

I recently had the opportunity to examine some of the melolonthine scarabaeids caught by the UV traps in the course of Canopy Biology Program, courtesy of Dr. Takao Itioka, Kyoto University.

To date, faunal reports on melolonthine beetles are scarce for Borneo Island.

Brenske (1893) produced the only report focusing exclusively on the Bornean melolonthines, which have historically been studied with beetles from other areas, or with those of other Scarabaeid taxa in many articles by European researchers (e.g., Brenske, 1892a, 1892b, 1894; Burmeister, 1855; Moser, 1908, 1912, 1915; Sharp, 1876). A great many new melolonthine species were described from Borneo Island in these and subsequent studies, but thorough revisional studies have never been conducted. In contrast to specimens used in older works, or those with ambiguous origins, the specimens obtained by the Canopy Biology Program have clear locality data, which is necessary to know the current status and distributions of these beetle species. Whilst useful information was provided by older studies of melolonthines in Sarawak, much remains unknown about the diversity and distribution of this group. Currently, specimens tend to be collected from mountaineous areas of Sabah State; seldom are they obtained from low elevation forests ,which are the focus of this study.

The specimens available to me could be readily separated into species. Hence, I judged it useful to create this species-level inventory of melolonthines, provided by Dr. Itioka. Specimens were largely collected from: i) a primary forest as part of the Canopy Biology Program in 1993 to 1994, and ii) from the National Park in LUBL Project, 2003.

Abbreviations of types of localities are as follows:
ZB= grassy plain, 1-year after the last slash-and-burn farming ended
ZG= rubber plantation around the national park
ZP= isolated primary forests around the national park

The following abbreviations denote the heights where the UV light traps were set:
T1= understory in the primary forest
T5, T7= Primary forest floor (5m and 7m above the ground, respectively)
T17= subcanopy of the primary forest (17m above the ground)
T35= canopy of the primary forest (35m above the ground)

All the specimens which I examined at this time will be deposited in Forest Research Center, Sarawak, Malaysia or Kyoto University Museum, Kyoto.

List

Subfamily Melolonthinae

Tribe Melolonthini

Subtribe Melolonthina

1. *Lepidiota caesia* Burmeister, 1855 (Fig. 1)

   1♀, Lambir Canopy Biology Prog., UV Light T17, III 22-26 '93/ SC0131; 1♀, same data as for the preceding specimen/ SC0133; 1♂, same data as for the preceding specimen except for UV Light T35/ SC0132.

2. *Leucopholis nummicudens* (Newman, 1838) (Fig. 2)

   1♀, Lambir Canopy Biology Prog. UV Light T35, II 21-25 '93/ SC0135.

3. *Leucopholis emarginata* Burmeister, 1855 (Fig. 3)

   1♀, Lambir Canopy Biology Prog., UV Light T17, IV 10-11 '94/ SC0091; 1♀, same locality as for the preceding specimen, UV Light T35, II 21-25 '93/ SC0136.

4. *Leucopholis sharpi* Brenske, 1896 (Figs. 4, 22)

   1♂, LUBL Project, Kishimoto-Yamada et Itioka, ZB 5A-011, VIII 17 '03/ LUBL S025/ SC0010.

5. *Psilopholis grandis* (Castelnau, 1840) (Fig. 5)

   1♂, Lambir Canopy Biology Prog., UV Light T17, III 22-26 '93/ SC0134; 1♂, LUBL Project, Kishimoto-Yamada et Itioka, ZG3B-016, IX 22 '03/ LUBL S026/ SC0009.

6. *Exopholis hypoleuca* (Wiedemann, 1819) (Fig. 6)

   1♂, Lambir Canopy Biology Prog., UV Light T17, II 21-25 '93/ SC0138.

7. *Asactopholis pectoralis* Moser, 1908 (Fig. 7)

   3exs., Lambir Canopy Biology Prog., UV Light T35, III 22-26 '93/ SC0143, SC0144 and SC0145 (any one label attached for the respective specimen of the three).

8. *Asactopholis gracilipes* (Sharp, 1876) (Fig. 8)

   2exs., Lambir Canopy Biology Prog., UV Light T35, III 22-26 '93/ SC0142 and SC0148 (either one label attached for the respective specimen of the two); 1ex., Lambir Canopy Biology Prog., UV Light T17, III 22-26 '93/ SC0149; 1ex., Lambir Canopy Biology Prog., UV Light T17, II 21-25 '93/ SC0150.

9. *Asactopholis sericea* Moser, 1913 (Figs. 9, 23)

   1♂, Lambir Canopy Biology Prog., UV light T1, III 21-26 '93/ SC0146; 1♂, same data as for the preceding specimen/ SC0147.

10. *Asactopholis laticeps* Moser, 1908 (Figs. 10, 24)

    1♂, LUBL Project, Kishimoto-Yamada et Itioka, ZP9C-013, IX 29 '03/ LUBL-S024/ SC0012.

    Notes. This species is allied to the preceding species. I distinguished this species from the preceding one by the following points: 1) branching pattern of paramere of male genitalia; 2) clypeus more strongly produced laterad; 3) blackish maculation of apical knob on elytron being obscure.

11. *Schoenherria borneensis* Brenske, 1894 (Figs. 11, 25)

1♂, Lambir Canopy Biology Prog., UV Light T1, XI 14-15 '93/ SC0141.

12. *Wadaia kaorui* Itoh, 1994 (Fig. 12)
1♂, Lambir Canopy Biology Prog., UV Light T35, III 22-26 '93/ SC0139.

Subtribe Rhizotrogina

1. *Octoplasia princeps* (Sharp, 1876) (Figs. 13, 26)
1♂, LUBL Project, Kishimoto-Yamada et Itioka, ZG9C-012, IX 14 '03/ LUBL S021/ SC0011.

2. *Miridiba waterstradti* (Moser, 1912) (Figs. 14, 27)
1♂, Lambir Canopy Biology Prog., UV Light T1, VI 18-22 '93/ SC0151.

Notes. Although this specimen feebly differs from the type specimen of this species of Brunei in its structure of paramere of male genitalia, I think it to be assigned to this species.

3. *Holotrichia* sp. (Figs. 15, 28)
1♂, Lambir Canopy Biology Prog., UV Light T35, III 22-26 '93/ SC0137.

Notes. This species belongs to Holotrichia serrata group and is thought to be new species.

4. *Sophrops rugulosus* (Brenske, 1892) (Figs. 16, 29)
1♂, Lambir Canopy Biology Prog., UV Light T7, II 21-25 '93/ SC0182.

Tribe Macrodactylini

1. *Dichelomorpha* sp. (Fig. 17)
1♂, Lambir Canopy Biology Prog., UV Light T35, X 7-8 '94/ SC0099; 1♂, LUBL Project, Kishimoto-Yamada et Itioka, ZP9C-0112, IX 11 '03/ LUBL S018/ SC0024.

Notes. Although all known species from Borneo, Sumatra and Malaysia were investigated for their original descriptions, this species was not assigned to any species of them. This species is thought to be new species.

Tribe Hopliini

1. *Hoplia magnifica* Arrow, 1932 (Fig. 18)
1ex., Lambir Canopy Biology Prog., UV Light (I) T5, I 12-13 '94/ SC0114.

2. *Hoplia thoracica* Moser, 1915 (Fig. 19)
1ex., Lambir Canopy Biology Prog., UV Light (I) Trap T35, I 14-15 '94/ SC0113.

3. *Hoplia* sp.1 (Fig. 20)
1ex., Lambir Canopy Prog., UV Light (I) T35, X 15-16 '93/ SC0100.

4. *Hoplia* sp.2 (Fig. 21)
1ex., Lambir Canopy Biology Prog., UV Light (I) T35, X 15-16 '93/ SC0101; 1ex., Lambir Canopy Biology Prog., UV Light T35, IV 13-14 '94/ SC0102.

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Figures 1–21. Habitus – 1, *Lepidiota caesia*; 2, *Leucopholis nummicudens*; 3, *L. emarginata*; 4, *L. sharpi*; 5, *Psilopholis grandis*; 6, *Exopholis hypoleuca*; 7, *Asactopholis pectoralis*; 8, *A. gracilipes*; 9, *A. sericea*; 10, *A. laticeps*; 11, *Schoenherria borneensis*; 12, *Wadaia kaorui*; 13, *Octoplasia princeps*; 14, *Miridiba waterstradti*; 15, *Holotrichia sp*.; 16, *Sophrops rugulosus*; 17, *Dichelomorpha sp*.; 18, *Hoplia magnifica*; 19, *H. thoracica*; 20, *H.* sp. 1; 21, *H.* sp. 2.

Figures 22–29. Male genitalia – 22, *Leucopholis sharpi*; 23, *Asactopholis sericea*; 24, *A. laticeps*; 25, *Schoenherria borneensis*; 26, *Octoplasia princeps*; 27, *Miridiba waterstradti*; 28, *H. sp*.; 29, *Sophrops rugulosus*.

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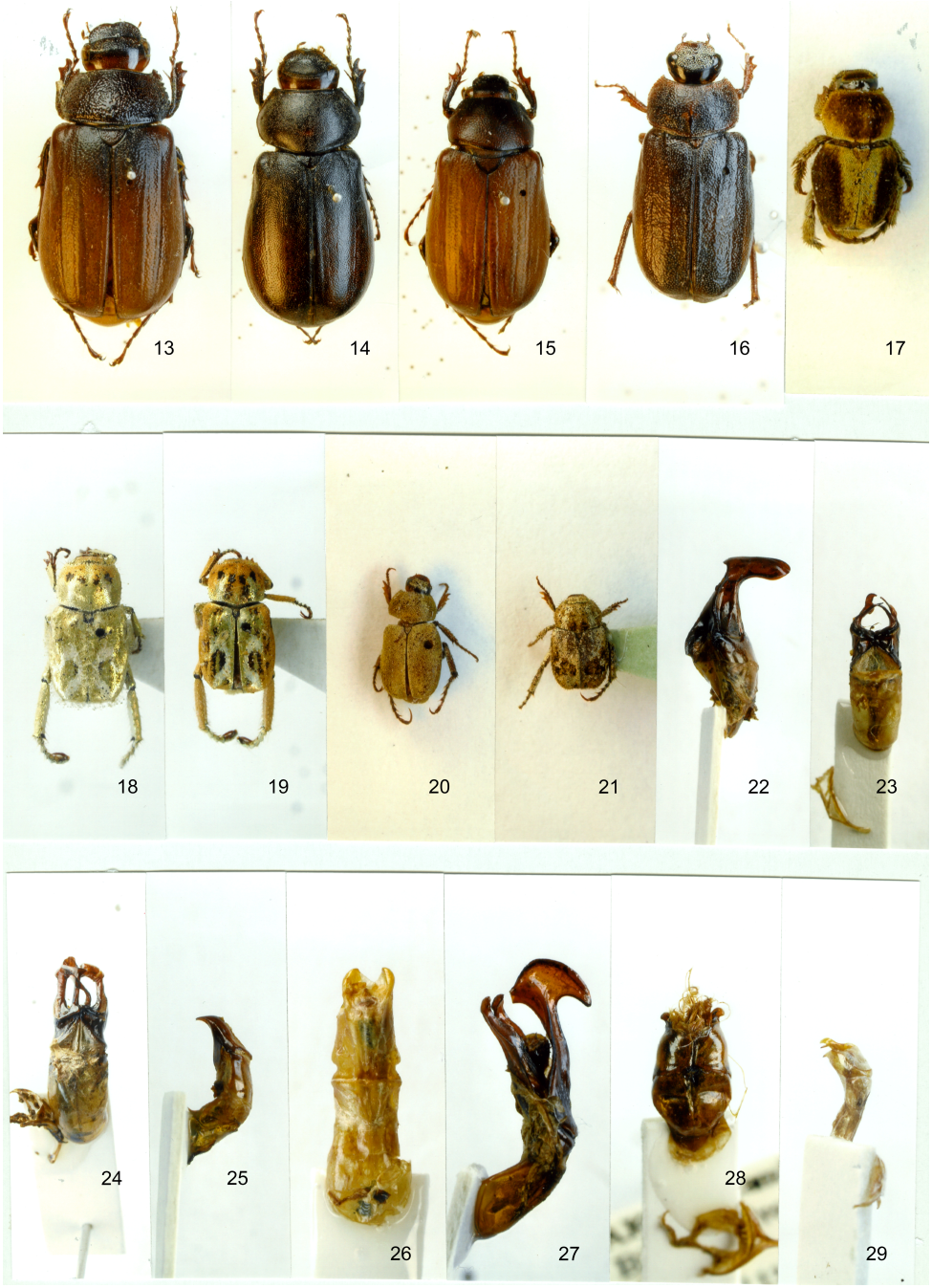
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